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ABSTRACT

The total span of procedures necessary for care of the human eye and its associated structures is broad. Two professional groups, optometrists and ophthalmologists share in providing this total care. Each must hold a valid current license to practice his or her profession and the extent of prerogative and limitations is spelled out in practice acts recorded in the Florida Statutes. Optometrists must complete a minimum of 2 years of college level instruction in a community college or university before enrolling in professional school. The duration of professional school for optometrists is 4 years, including clinical experience, which leads to the degree of Doctor of Optometry (O.D.). Ophthalmologists are basically doctors of medicine or osteopathic medicine. Although most practicing optometrists use some assisting personnel, the potential or more extensive use of technically trained assistants has been little exploited to date. Firm data on which to establish an acceptable order of priority among the several health professions' educational programs do not exist at this time. Continuing, intensive planning will be necessary. (Author/PG)

ED 087314

MANPOWER AND EDUCATION NEEDS FOR EYE CARE IN FLORIDA

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Of the: Florida Optometric Association
Florida Society of Ophthalmology
Florida Health Planning Council Health Manpower Committee
Florida Medical Association Committee on Medical Schools
Florida Board of Regents Health Affairs Committee

SUMMARY

The total span of procedures necessary for care of the human eye and its associated structures is broad. Two professional groups, optometrists (O.D.) and ophthalmologists (M.D. or D.O.), share in providing this total care. In turn each professional group is assisted by technical personnel trained on the job or, recently, in formalized programs.

Optometrists outnumber ophthalmologists in a ratio of roughly 2:1 in the U.S. (18,000 vs. 9,000) and in Florida (659 vs. 389). Each must hold a valid, current license to practice his or her profession and the extent of prerogative and limitations is spelled out in practice acts recorded in the Florida Statutes.

Three out of four Florida optometrists practice solo, but there appears to be a trend toward practicing in groups. The work week is generally about 40 hours and each sees, on the average, between 58 and 75 patients per week.

Optometrists must complete a minimum of two years of college level instruction, in a community college or university, before enrolling in professional school. There are at present 12 professional schools in the U.S.; seven university-affiliated and five freestanding. The average graduating class size among these schools is 58, leading a national commission on optometry to recommend expansion to, "...a minimum size for an entering class of between 60 and 75 students."

The duration of professional school for optometrists is four years which includes clinical experience and leads to the degree of Doctor of Optometry (O.D.). At the end of six years of post-high school formal education he or she is eligible for state licensure examination and, if licensed, to begin professional practice.

Ophthalmologists are basically doctors of medicine or osteopathic medicine. To achieve this status a minimum of three years of college level instruction must precede four years of medical school. Preparation for the specialty of ophthalmology then requires four additional years of clinical experience (internship and residency).

The terms need and demand have different connotations in health manpower projections. The former is generally used by professional groups and health planners and reflects what professional providers consider the public should have to optimize its health care. Demand, on the other hand, reflects a free market consumption of services by the public which must choose among alternatives for spending its available resources. The disparity can be pronounced in those instances in which care is elective, as in much of eye care.

There is said to be a great deal of unattended eye care need throughout the U.S. The exact nature of this need, and how best to meet it, is not clear. Likewise there is evidence that, as a group, older people require more services than younger age groups. But a clear delineation of what these needs are, and what services are required to best provide for these needs, should be determined.

Should the financial barrier to broad coverage eye care be removed it is likely the requirements for professional services will increase considerably. This could come about if a national health insurance plan were effected and its eye care coverage was extensive. That greater requirement would likely extend to all of the personnel categories involved in providing eye care.

A highly respected study commission (appointed by the National Commission on Accrediting) which attempted to determine the future needs for optometrists in the U.S. concluded that factors such as population growth and ageing, and removal of the financial barrier would boost the demand for optometric services but this increase will be met in part by greater use of automation and assistants and increase in efficiency of delivery of care. Their projections, applied to Florida, show a need for +279 optometrists by 1980 to reach the minimum, +383 to reach medium, and +681 to reach maximum.

Although most practicing optometrists use some assisting personnel, the potential of more extensive use of technically trained assistants has been little exploited to date. Such prepared personnel have only recently become available, but as yet in small numbers, as a result of new programs in two of Florida's community colleges. Ophthalmologists, too, are in the early stages of working with a technically trained assistant and this development likewise gives promise of expanding the effectiveness of the professional practitioner.

Finally, little can be said about providing opportunities to pursue a professional career to the youth of a state. Opinions differ on the importance of employment opportunity in influencing enrollment restrictions. Study opportunity does not meet demand in many existing professional programs in higher education (medicine, dentistry, veterinary medicine, law, etc.) but cost of operating professional schools is no small consideration. In the final analysis, firm data on which to establish an acceptable order of priority among the several health professions' educational programs do not exist at this time. Continuing, intensive planning will be necessary.

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Chapter I

MANPOWER AND EDUCATION NEEDS FOR EYE CARE IN FLORIDA

Eye care services are a shared responsibility of two professional groups - optometrists and ophthalmologists. Both hold doctoral degrees, the former the Doctor of Optometry (O.D.) and the latter the Doctor of Medicine (M.D.) or Doctor of Osteopathic Medicine (D.O.) with additional specialization supervised by the American Board of Ophthalmology. Both must hold a license to practice his profession, obtained from a state appointed examining board.

Optometry dates its origin as a profession to the late 1800's. By the beginning of this century there were 60 private training schools in the United States. The first university-based program was established at Columbia in 1910 as a two-year course. By 1925 there were three other university-based programs, each four years in length. In the 1950's the program was lengthened to five years and in the 1960's to six years post-high school. The first two years are generally taken in any university or community college. The professional school is then of four years duration leading to the degree, Doctor of Optometry (O.D.).

The admission requirements for professional school as represented by the School of Optometry of the University of Alabama in Birmingham are as follows:

Course	Semester Hours
English	6
Chemistry	10
Chemistry - organic	6
Physics	8
Mathematics (calculus)	6
Psychology	6
Biology	9
Social & Behavioral Sciences	6

The nature of the professional curriculum is represented by the following course titles:

First Professional Year

Fall Quarter

Visual Optics I
Gross Human Anatomy and Anatomy of the Eye
Introductory Biochemistry
Optometric History and Orientation

Winter Quarter

Visual Optics II
Microbiology
Neuroanatomy
Mammalian Physiology I
Clinical Observation

Spring Quarter

Visual Optics III
Comparative Neurobiology of Vision
Mammalian Physiology II
Visual Psychophysics and Physiology I
Clinical Observation

Second Professional Year

Fall Quarter

Clinical Examination of the Visual System
Eye Movement Mechanisms
Visual Optics IV
Visual Psychophysics and Physiology II

Winter Quarter

Clinical Examination of the Visual System II
Normal Binocular Vision
Ophthalmic Materials I
Visual Perception

Spring Quarter

Clinical Examination of the Visual System III
Anomalies of Binocular Vision
Ophthalmic Materials II
Vegetative Physiology of the Eye

Third Professional Year

Summer Quarter

Clinical Practice of Optometry I
Clinical Colloquia I
Diagnosis and Treatment of Anomalies of Binocular Vision I
Psychophysics of Vision Tests and Measures

Fall Quarter

Clinical Practice of Optometry II
Diagnosis and Treatment of Anomalies of Binocular Vision II
Clinical Ocular Disease I
Systemic Pathology I
Clinical Colloquia II
Pediatric Optometry

Winter Quarter

Clinical Practice of Optometry III
Clinical Ocular Disease II
Systemic Pathology II
Visual Rehabilitation
Geriatric Optometry
Clinical Colloquia III

Spring Quarter

Clinical Practice of Optometry IV
Clinical Ocular Disease III
Clinical Medicine for Optometrists
Ocular and Systemic Pharmacology
Contact Lenses
Clinical Colloquia IV

Fourth Professional Year

Summer Quarter

Advanced Clinical Practice of Optometry I
Special Clinical Practice I
Clinical Colloquia V

Fall Quarter

Advanced Clinical Practice of Optometry II
Epdemiology of Visual and Systemic Disorders
Legal and Ethical Aspects of Optometry
Clinical Colloquia VI

Winter Quarter

Advanced Clinical Practice of Optometry III
Special Clinical Practice III
Optometric Practice Management
Developmental Aspects of Visual Performance
Clinical Colloquia VII

Spring Quarter

Advanced Clinical Practice of Optometry IV
Special Clinical Practice IV
Applied Phychology for Optometrists
Recent Advances in Visual Science
Clinical Colloquia VIII

Optometry and optometrists are defined in paragraph 463.01, Florida Statutes, as follows:

> **463.01 Optometry and optometrist defined.**— The practice of optometry is declared a profession, and, for the purpose of this chapter, is defined as follows, viz: to be the diagnosis of the human eye and its appendages, and the employment of any objective or subjective means or methods for the purpose of determining the refractive powers of the human eyes, or any visual, muscular, neurological or anatomic anomalies of the human eyes and their appendages, and the prescribing and employment of lenses, prisms, frames, mountings, orthoptic exercises, light frequencies and any other means or methods for the correction, remedy, or relief of any insufficiencies or abnormal conditions of the human eyes and their appendages. An optometrist is one who practices optometry in accordance with the provisions of this chapter.

In 1968 there were 18,400 practicing optometrists in the U.S., 16,250 of whom (90%) were self-employed. Of these 13,550 were in solo practice, 2,200 in partnerships and 500 in group practices. The 2,150 salaried optometrists included about 1,100 employed by other optometrists or physicians, 650 by firms, corporations and organizations, and 400 by governments and other.[1]

In addition to optometrists and ophthalmologists there are others who specialize in, and contribute to, eye care. These are optical technicians who grind lenses to prescriptions and dispensing opticians who fit vision aids. There were approximately 15,000 of the former and 10,000 of the latter in 1968. Finally, there were about 10,000 ophthalmic assistants who assisted ophthalmologists and about 18,000 optometric assistants who assisted optometrists.[2] In the main, these assistants have been trained "on the job" rather than in a formal program.

The nature of the services rendered by practicing optometrists in the U.S. was investigated by the U.S. DHEW in 1968.[3] Among the slightly over 18,000 active optometrists the following percentages were found to be offering the following services:

Service Rendered	By % of Practitioners
Refractions	100%
Dispensing and Adjusting	94
Ophthalmoscopy	93
Frame repairs	85
Contact lens fitting	79
Visual field testing	75
Tonometry	66
Visual training/orthoptics	50
Low vision aids	41
Fabrication of eyeware	36

The following is quoted from a recent SREB publication on optometric manpower:[4]

> "The function of optometrists is to restore, maintain and enhance visual performance. Children with vision problems seldom outgrow them but require attention to maintain optimum performance. Fortunately optometric knowledge and technology can restore near normal function to the vast majority of individuals with vision problems. Vision problems, uncorrected, do interfere with visual performance: for example, learning in school children, job performance and driving in adults. The compensation for refractive errors by spectacle lenses or contact lenses is not sufficient in some cases to establish, maintain or enhance visual performance. Vision therapy, sometimes called orthoptics or vision training, is required to establish or re-establish the efficient functioning of the binocular coordination and perceptual processes. Thus the treatment methods of optometry depend on educational and psychological techniques as well as optical, physiological and biomedical approaches."

The overwhelming proportion of active optometrists report their primary activity as general practice. As can be seen above this involves mainly a determination of visual performance with the prescription and fitting of visual aids.

A survey made by the Public Health Service in 1965-66 indicated that approximately 30 percent of the people who acquired glasses in the two-year period before the survey obtained prescriptions for their lenses from ophthalmologists. Somewhat more than 60 percent had obtained their prescriptions from optometrists. Presumably the others purchased glasses "over the counter."[5]

The medical/surgical specialty of ophthalmology has been described as follows:[6]

> "Ophthalmologists are physicians (M.D. or D.O.) who specialize in the medical and surgical treatment of eye disease or other ocular abnormalities, in addition to providing many of the vision care services rendered by optometrists. Several sub-groups may be distinguished according to their training and qualifications...
>
> "First is the board-certified ophthalmologist, a medical doctor who has completed four years of medical school, an internship and a three-year residency in ophthalmology at a hospital offering such training program, and who has passed the examination for certification by the American Board of Ophthalmology.
>
> "Next is the ophthalmologist who has completed the residency in ophthalmology but who has not yet been certified by the American Board of Ophthalmology. Certification is not required to practice ophthalmology, but most physicians who have completed a residency in ophthalmology voluntarily seek Board certification.

"Another sub-group includes the EENT specialist, the physician who completed a residency in eye, ear, nose, and throat care. This specialty is no longer offered in residency programs, but many EENT specialists are still practicing in the field of ophthalmology."

The number of active ophthalmologists in the U.S. is roughly half the number of practicing optometrists (9,000 vs. 18,000).

The National Center for Health Statistics likewise studied in considerable detail in 1968 the clinical services rendered by practicing ophthalmologists. These data showed that the following activities are engaged in by the following proportion of practitioners:[7]

Service Rendered	By % of Practitioners
Diagnostic exam (including tonometry)	99.5%
Medical treatment	97.9%
Visual field exam and medical interpretation	93.7
Eye surgery	88.9
Contact lens fitting	58.0
Low vision aids	54.9
Tonography	49.8
Orthoptic training	32.5
Aniseikonic testing	9.4

Considerable sophistry and mistrust characterize the professions of optometry and ophthalmology toward each other, although these attitudes frequently do not extend to individuals within the groups who are often good friends. There is unquestionably a degree of overlap in clinical practice, in spite of widely differing educational preparation. Both professions do have major contributions to make to human eye care and the need for additional eye care services cannot be addressed satisfactorily by discussing either profession alone.

Chapter II

The Practice of Optometry in Florida

In order to shed light on the true nature of optometric practice in Florida a questionnaire was constructed which closely resembles that used by the United States National Center for Health Statistics. After refinement with the aid of a few practitioners the questionnaire was distributed and collected by Dr. Robert J. Sennett, immediate past President of the Florida Optometric Association (FOA). Each respondee was assured anonymity. Questionnairs were returned by 345 of the 540 licensed FOA member optometrists in the State. Not all questions were answered by every respondee, but on the whole the sample appears to be reliable.

The following data are assumed to represent all Florida Optometrists, although it comes from only 64% of the total group. For the most part the results will be presented as percentages, thereby applying both to the sample and to the total optometric population.

Ninety-seven percent of Florida's optometrists are self employed and 69% are in solo practice. Comparable data from a few other states are:

State	Self Employed	Solo Practice
Wisconsin	76%	57%
South Carolina	85%	69%
Georgia	75%	61%
Texas	74%	51%
North Dakota	86%	63%
Alaska	75%	50%

A study of all U.S. active optometrists in 1968 revealed 88% self-employed and 75% in solo practice.[8]

According to the sample, 28% of Florida's optometrists are in partnership or group practice and the average size of such associations is 2.4 with 81% of them having two, 12% having three and only 7% with four or more in the group. This value of 28% for Florida is higher than the national average in 1968 which was then 15% in partnership or group practice.

A question was asked concerning the size of the practice community, both size of city and of metropolitan area. Those results were:

Size of City	% of Practicing O.D.'s
Under 2,500	1
2,500 to 15,000	21
15,000 to 50,000	28
50,000 to 500,000	38
over 500,000	12

Metropolitan Area	% of Practicing O.D.'s
Under 50,000	22
50,000 to 500,000	26
Over 500,000	52

The average work week for practicing optometrists in our sample was 40.2 hours for an average of 49 weeks per year. Two-thirds of the sample worked between 34 and 46 hours per week. Again for comparison the United States 1968 survey reported for all O.D.'s:

Hours per week	% of O.D.'s
1-34	12
35-40	38
41-48	32
49 up	18

In the United States 1968 sample, 92% worked 48-52 weeks per year.

During an average week our sample showed the average optometrist will have the following number of appointments in his books if he is in solo practice:

Winter	58
Spring	58
Summer	56
Fall	61
AVERAGE	58

If, on the other hand, he is practicing in a partnership or group his appointment book shows for a given week:

Winter	76
Spring	74
Summer	73
Fall	76
AVERAGE	75

It seems worthy of note that the O.D. practicing with others shows an average of 17 more patients per week, or an increase of nearly 30% in efficiency.

The 1968 survey for the U.S. reflected the following numbers of patients per week for each practicing O.D.[3]

No. of Patients/wk.	% of Practicing O.D.'s
Under 25	22
25-49	38
50-74	20
75-99	10
100 or more	10

Median 43.2

On the basis of the data obtained in the Florida practitioner sample it would appear the average optometrist sees between 12 and 16 patients on an average day.

It is of further interest to note that a recent survey of practicing dentists in Florida, also based on 50% returns of the questionnaire, showed that on the average a dentist sees 59.2 patients per week for 47.5 weeks per year.[9] Both values are strikingly close to those for solo practicing optometrists.

The kinds of services rendered by Florida O.D.'s may be seen in the next table. The number of optometrists among the 345 of our sample providing each service is shown, along with the number of patients receiving these services from each practitioner during an average week.

Service	No. Optometrists	No. Patients/wk.	
		Mean	Standard Deviation
Dispensing and alignments	303	44	± 26
Ophthalmoscopy	309	39	± 16
Refractions	320	31	± 16
Fabrication of eyeware	128	30	± 26
Tonometry	308	21	± 12
Biomicroscopy	245	18	± 16
Frame repair	279	13	± 10
Contact lense fitting	199	8	± 10
New patients	274	2	± 3
Follow-ups	210	6	± 7
Visual training/orthoptics	88	6	± 6
Developmental vision	64	4	± 6
Visual readiness for reading	50	5	± 5
Low vision aids	65	1.5	± 1
Aniseikonic testing	11	3	± 3

Once more for comparison with the 1968 U.S. Report, the following table is presented:

Service	% of O.D.'s Providing Service	
	U.S. 1968	Florida 1973
Refractions	100	100
Dispensing and adjusting	94	94
Ophthalmoscopy	83	96
Frame repairs	85	87
Contact lens fitting	79	85
Visual field testing	75	62
Tonometry	66	96
Visual training-orthoptics	50	27
Low vision aids	41	20
Fabrication of eyeware	36	40

The use of auxiliary personnel is both widespread and important in the practice of optometry. The survey of Florida O.D.'s showed 93% use supplementary personnel. This figure compares well with that of other selected* states: Wisconsin 85%, South Carolina 93%, Texas 84% Georgia 81%, North Dakota 89%, and Alaska 88%. In the United States 1968 study the propo:tion reporting some assistants was 78%.

Nearly all have one or more secretary/receptionists, about half use general optometric assistants and those who do, frequently employ more than one. Less than 17% use optometric technicians and under 20% employ dispensing opticians. Fourteen percent employ optical technicians but very, very few employ specialized contact lens technicians.

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*"Selected" on the basis that only six states have been tabulated thus far in recently published data by U.S. HEW Health Resources Administration. Data for each state are in preparation.

Chapter III

Optometry Education in the U.S.

There are now 12 colleges of optometry in the United States, seven university affiliated and five freestanding. Their names, together with certain enrollment data, are shown in the following table:

School	Enrollment 1972-73	Graduates 1971	1973	Expected 1975
Alabama	70	-	7	23
California (Berkeley)	214	32	45	53
Houston	242	61	57	57
Indiana	248	47	54	60
Ohio State	210	42	47	56
New York	45	-	-	20
Pacific	274	57	66	66
Illinois	497	70	106	114
Massachusetts	251	37	55	64
Pennsylvania	507	86	100	124
Southern California	261	52	58	61
Southern	498	45	96	119
TOTAL	3,317	529	691	817

A great many of Florida's optometrists were graduated from Southern College of Optometry in Memphis. The other two schools in the South, University of Houston and University of Alabama in Birmingham, are both newer and as yet smaller.

Recently Southern, as with private schools generally, has had financial stresses. The school embarked upon an expansion plan encouraged by recent Federal Health Manpower Training Acts. That source of revenue has been unreliable of late. Southern, along with many other schools, must find replacement funds or retrench severely.

According to the 1973 Annual Survey of Optometric Educational Institutions conducted by the Council on Optometric Education of the AOA, 149 Florida residents were enrolled in U.S. colleges of optometry. The ten states having the highest number of students enrolled were as follows:

State	#O.D. Students	1973 Population Rank
California	421	1
New York	323	2
Ohio	200	6
Pennsylvania	199	3
Indiana	176	11
Illinois	168	5
Florida	149	9
Michigan	139	7
Texas	117	4
Massachusetts	97	10

The Southern Regional Education Board has recently added optometry in its multi-state support program. Florida has joined this move and has entered into contract with two of the optometry schools of the region for subsidy in return for 20 secured places for Florida residents in each entering class beginning in 1974 as follows:

Southern - 15
Houston 5

Such an arrangement will likely restore the opportunities for an optometric education for Florida residents to the ±40 per year level of recent years since about half of Florida's students have traditionally gone to other than regional schools.

The number of entering Florida students in the recent past at all U.S. institutions has been:

1970 - 33
1971 - 43
1972 - 40
1973 - 18

The serious drop in entering students in the Fall of 1973 was occasioned by a sudden change by Southern College to requirement of contract support of entering places for 1973. This occurred too late to seek Legislative appropriation for that class.

It should be noted, classes in optometry schools tend to be small; only two of the 12 had 100 or more graduates last year. The average graduating class was only 58. It was recommended in the National Study of Optometric Education that the <u>minimum</u> size of an entering class should be 60 to 75 students.[10]

Chapter IV

Present Vision and Eye Care Manpower in Florida

As of 10 August 1973 the total number of optometrists living in Florida and holding an updated license to practice their profession was 559 according to the Department of Professional and Occupational Regulations. Since that time a few have been added on the basis of the 1973 licensure examination. The August distribution throughout the state, by county, is shown below.

The number of ophthalmologists residing in the state and holding a current license to practice was 389 on 2 February 1973. Their distribution by county is likewise indicated in the same table.

Distribution by county may well provide a convenient, but misleading, way of representing eye care manpower. For the most part eye care needs are elective and non-emergency at the time of entry into the system of care. Availability of services for scattered, predominately small populations are probably better defined by districts other than county boundaries but clear delineation of this availability is beyond the scope of this report at this time.

From the standpoint of total numbers within the state, disregarding for the moment their geographic distribution, Florida has a ratio of 1:11,200 optometrists to population and 1:19,000 for ophthalmologists.

The National Study on Optometric Education done for the National Commission on Accrediting states there are approximately 18,000 optometrists and 9,000 ophthalmologists actively practicing in the United States. To the extent the holders of current licenses in Florida can be presumed to be practicing, the above ratios for Florida compare favorably with those for the United States: 1:11,600 (optometrists) and 1:23,200 (ophthalmologists).

County	Number of Ophthalmologists February 1973	Number of Optometrists August 1973
Alachua	24	5
Baker	-	1
Bay	2	7
Bradford	1	3
Brevard	7	18
Broward	33	71
Calhoun	-	-
Charlotte	2	2
Citrus	-	3
Clay	1	5
Collier	3	4
Columbia	-	2
Dade	108	129
Desoto	-	1
Dixie	-	-
Duval	25	36

(continued)

County	Number of Ophthalmologists February 1973	Number of Optometrists August 1973
Escambia	12	11
Flagler	-	-
Franklin	-	-
Gadsden	-	2
Gilchrist	-	-
Glades	-	-
Guif	-	1
Hamilton	-	-
Hardee	-	1
Hendry	-	1
Hernando	-	2
Highlands	-	4
Hillsborough	24	46
Holmes	-	-
Indian River	2	3
Jackson	-	2
Jefferson	-	1
Lafayette	-	-
Lake	2	10
Lee	5	14
Leon	5	8
Levy	-	1
Liberty	-	-
Madison	-	1
Manatee	6	8
Marion	2	9
Martin	1	3
Monroe	1	4
Nassau	-	2
Okaloosa	2	6
Okeechobee	-	2
Orange	24	45
Osceola	-	4
Palm Beach	22	42
Pasco	1	6
Pinellas	34	60
Polk	11	19
Putnam	-	3
Santa Rosa	1	1
Sarasota	13	19
Seminole	2	7
Saint Johns	1	1
Saint Lucie	3	3
Sumter	-	-
Suwannee	-	1
Taylor	-	1
Union	-	-
Volusia	8	17
Wakulla	-	-
Walton	-	1
Washington	-	-
TOTALS	389	659

Chapter V

Future Manpower Requirements

Demand and need are two frequently used, but often confused, terms in a discussion of health manpower, In general, the former is most frequently used by health economists while the latter is more familiar to health professionals and health agencies.

The term need is generally applied on the basis of professional judgment of the quantity of health services a society ought to consume over some specified period to attain optimum health and is usually independent of economic considerations.

Demand, on the other hand, is a market phenomenon based on consumer choice. In many cases a population may view its own health needs differently than does the provider, based on the competing alternatives for his available resources. The disparity in the above concepts is pronounced in the eye care field where services are often elective.

There are numerous studies which indicate that at least 20% of the population of the United States have unmet vision care needs. These needs are in three principal areas: comprehensive examination and vision care for school children, comprehensive vision care for those living in impoverished rural and urban areas, and the special vision care needs of the elderly.[11] There are reasons to believe this extent of unmet needs is as high in Florida as elsewhere.

The incidence of vision defects is strongly correlated with age as the following table shows:[12]

Age	Percent of Population with Vision Defects
Under 20	23%
20 to 30	39
30 to 40	48
40 to 50	71
50 to 60	82
Over 60	95

A figure frequently cited in publications dealing with optometrists needed is a ratio of 1:7,000 persons. The origin of this figure bears looking into.

Birchard and Elliott[13] appropriately examined this question, "...in the light of socio-economic trends in health care" as envisioned in 1966. At that time a national health insurance program, with extensive eye care included, was believed by the authors to be imminent. After an impressive collection of data on practice habits of civilian and military optometrists, to which certain assumptions about the population were adapted, the authors derived optimum ratios of optometrists to population under a national health care plan in 1970 and 1980. The authors stated:

> "Under a National Health Plan it is possible that optometrists would be required to perform more than 65 percent of the refractions, just as they do in the Armed Forces today. Ophthalmologists would become busier than ever with patients requiring medical and surgical care and would probably be glad to leave more of the refractions to the optometrists as they do at the present time in the Armed Forces. If this were to occur (today's) ratios would not be adequate. In order to help prepare for such an eventuality, it is the opinion of the writers of this study that the above ratios should increase slightly and that an optimum ratio of optometrists to population under a National Health Plan in 1970 or 1980 would be 1:7,000. This would be actual practicing optometrists to population and would require 29,847 optometrists in 1970 and 35,105 optometrists in 1980.
>
> "The present ratio of 1:12,000 which is adequate at this time, would provide only 17,410 practicing optometrists in 1970 and 20,477 in 1980. To follow the present ratio would result in a critical shortage of optometrists under a National Health Plan."

The point is of course, we do not have a national health plan in 1974 and whether or not we are much closer to one than was true in 1966 is open to question. Almost no determination of the implications of such a change in health care delivery has been made in manpower requirements in any of the other health fields.

The 12-member Commission on the Study of Optometric Education appointed by the National Commission on Accrediting to the question of future needs for optometrists.

1. The average ratio in the United States is now 1:11,000.

2. In Great Britian, with its national health service, the ratio of optometrists to population is 1:10,050 and for ophthalmologists 1:53,600. Under the British plan 19% of the vision testing is done by ophthalmologists and 81% by optometrists.

3. The average utilization of optometrists in six U.S. voluntary prepayment plans examined was 1:16,500 members. The range was 1:12,000 to 1:18,750.

4. The Commission acknowledged the ratio of 1:7,000 as "highly desirable, but it is unrealistic to expect that it could be reached by 1980." They pointed out that four states and 20%

of the counties in the United States have such a ratio at present. They found no evidence that such a ratio represents an oversupply.

The Commission developed figures for minimum, medium and maximum goals for 1980 based on optometrists to population ratios of 1:10,000, 1:9,000 and 1:7,000.[14] The minimum goal of 1:10,000 is based on the assumption that "The demand for optometric services (will) increase 10 percent because of a variety of group health plans, and also in relation to population growth." Since publication of their report the projected population growth of the United States has been scaled down, making some of their projections of numbers too high. Using their ratios and the more recent population projection figures of the United States Department of Commerce Series P-25, No. 493 December 1972 (Series E) and those of the Divison of Population Studies of the University of Florida College of Business Administration (July 1973) the following projections of need have been computed:

	Number of Optometrists Needed in 1980		
	Minimum 1:10,000	Medium 1:9,000	Maximum 1:7,000
U.S. (pop. 1980: 224 million)	22,400	24,889	32,000
Fla. (pop. 1980: 9,378,700)	938	1,042	1,340

For comparison there are now approximatley 20,000 optometrists in the United States with about 18,000 in active practice. In Florida there are 659 residents of the State holding a current license to practice.

It may be calculated that for Florida to attain the numbers indicated above by 1980 the annual net increase* needed over the intervening seven years is:

For minimum	40 per year
For medium	55 per year
For maximum	97 per year.

Data from the Department of Professional and Occupational Regulations showing the number of active license holders with Florida addresses shows a net increase of 24 between 20 July 1972 and 10 August 1973 (635 and 659, respectively). The net increase in Florida during 1973 was 29 according to the Office of the State Board of Licensure.

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*Among practicing physicians HEW has determined an average annual attrition from all causes, including death and retirement, of 15/1000/year. A comparable figure may be assumed for optometrists.

Chapter VI

Licensure of Optometrists

Optometry, along with other licensed professions in Florida has long had licensure requirements that have been interpreted to discourage all but the most capable of the newer graduates of the U.S. Schools. Many of these regulations have been modified recently, including those covering optometry.

In October 1972 the Florida State Board of Optometry Rules and Regulations were modified to change the citizenship requirement for eligibility to declaration of intent. More recently a modified form of reciprocity with other states "of equal standards" has been proposed.

Based on the experience of the medical profession wherein similar licensure modifications of requirements in recent years have resulted in a two to threefold increase in licenses issued, these changes may well result in an upsurge of practicing optometrists entering the state in the next few years.

The experience of the optometry licensing board over the past five years has been as follows:

Year	Candidates	Passed	Failed	(% Failure)
1969	48	33	15	31
1970	42	29	13	31
1971	57	44	13	23
1972	81	52	29	36
1973	103	73	30	30

The above failure rate is a little high, at least in comparison with the experience of five neighboring states where the composite failure rate during the recent past has been 11.5%. To some degree a higher rate locally may be related to a different profile of candidates.

Another recent change in Board policy has sought to provide at least some of the unsuccessful candidates an opportunity to avail themselves of a valuable learning experience in the interim prior to the next examination. The Board has stated, "With Board approval, unlicensed optometrists who have made application for the next examination, and who meet the prerequisite requirements of an applicant for board examination may work under the supervision of an approved Florida licensed practitioner for a specified period of time as determined by the Board."

Both the number of candidates and the number qualifying for a license to practice increased materially in the past year. With the further prospect of licensure by reciprocity for at least some candidates in the future it would appear this increase in number of new licensees will result in a higher net annual increase in optometrists practicing in Florida in the future.

Chapter VII

Use of Para-Personnel

"If each health professional devoted most of his time to work requiring his highest professional skill, many additional paraprofessional persons could be utilized. Therefore, optometrists should be utilized at their highest level of training and licensed privilege. Further, optometrists should be encouraged to turn over routine or nonjudgment functions to auxiliaries who ought to work under their direct personal supervision. As a result, some present professional shortages could be reduced."
(National Commission on Optometric Education)

The value of delegation of tasks requiring lesser skills to assistants and technicians is currently recognized in a growing number of the health professions. Both of the professional groups identified with eye care, optometrists and ophthalmologists, have recognized the need for such aides and have devised programs for their formal preparation.

Estimates vary on the impact of a trained assistant on the practice of an optometrist but most agree it is substantial. As yet, however, few practitioners in Florida have had the opportunity to experience the help of trained assistants and few firm data are available.

It has long been customary in most optometric practices to delegate appointment making, record keeping, bookkeeping, reception of patients and to some degree, frame selection.[15] The extent of delegation of other tasks does, of course, depend upon the skill level and preparation of the delegatee. To date there has been no established universal preparation of such assistants.

It is worth mentioning in passing that, as in many other fields, the potential of the computer as an aid in the practice of eye care has had little development to date. There is some evidence, however, that it may become a factor in the determination of future manpower needs.

In a study of the effect of human and computer assistance of practicing optometrists[16] it was concluded that an optometrist with adequate human and computer assistance "could take care of as many as six patients per hour instead of one since he requires only ten minutes per patient rather than an hour." The authors also point out that their results probably apply equally to ophthalmologists who refract. The authors conclude:

"The maximum use of delegation to both computer assistant and to human assistants points to a likely future trend. The optometrist will spend an increasing percentage of his time in

those fields which cannot be readily assisted, although to maintain control of the quality of the procedure, he must continue to be knowledgeable and skillful in all aspects of the examination including those fields which can be automated or assisted. It also indicates that if he is going to continue his relative role in visual care vis-a-vis ophthalmology (also computer assisted), he will have to work towards performing a greater number of eye examinations.

"In sum, the conclusion appears inescapable that unless the demand for refractions, contact lenses, and other optometric services increases to fill the greater capacity brought about by the expected greater use of assistance, both human and computer, in both optometry and ophthalmology, optometrists may be under pressure to enlarge the scope of optometric practice. If such a move to enlarge the area of competence of optometry is considered, it would be foresighted to plan now an expanded education in those fields for optometrists."

There are now two programs in Florida training optometric technicians. These are two-year associate degree programs at Miami-Dade and St. Petersburg Junior Colleges. The nature of this course may be seen from the curriculum at St. Petersburg Junior College.

Freshman Year

Intermediate Typing	2 Semester Credit Hours
Composition or Communications	6
American Government	3
Introductory Mathematics	3
Optometric Procedures	6
Optometric Lab. Skills	3
Visual Skills	2
Physical Sciences	3
P.E. & Elective	4

Sophomore Year

Secretarial Practices	3 Semester Credit Hours
Optometric Procedures	3
Optometric Lab. Skills	3
Contact Lenses	3
Ophthalmic Dispensing	6
Visual Fields	2
Visual Training	5
Human Relations in Industry	3
Fundamentals of Speech	3

The program at Miami-Dade began in 1969 and to date 31 students have been graduated. In the current year (1973-74) there are 25 sophomores and 35 freshmen enrolled. St. Petersburg's program is now in its third year of operation having graduated its first class of four in May 1973 and has now 10 sophomores and 26 freshmen enrolled.

It is apparent that experience is short in the use of, and effect of, qualified optometric technicians in Florida. The newer graduates of optometric colleges have, as a rule, learned of the value of such aides and how to use them effectively. Many older practitioners are less than enthusiastic about learning.

Ophthalmologists, too, are in the early stages of the development of a corps of technical help. The name given to this aide is Ophthalmic Technician and currently programs for their preparation are conducted in Departments of Ophthalmology of the Universities of Miami and Florida Colleges of Medicine.

The curriculum for this program is less formalized since it is a certificate rather than degree program. At the University of Florida the course is as follows:

July

Anatomy, histology, bacteriology, optics, strabismus, orthoptics, physiology, pharmacology, refraction, visual fields, tonometry, tonography, ocular emergencies, medical terminology, history taking, ophthalmic surgery, sterile technique, and training in use of all the instruments used in ophthalmic care.

August - October

The second rotation is on the strabismus service at the university of Florida Medical Center. Training in the use of orthoptic instruments, diagnosis and orthoptic treatment of patients with deviation of the eyes or malformality of the ocular muscles. This involves primarily working with children.

November - February

The third rotation through the refraction service at the University of Florida Medical Center involves fitting patients for regular spectacle glasses, regular contact lenses and soft lenses.

March - June

A fourth rotation is at the Veterans Administration Hospital for training in operating room technique, ward management technique, and assistance in the eye clinic.

July - October

Rotation in University Hospitals, University of Florida, including operating room, ward and clinic experience.

November - February

Rotation, Veterans Administration Hospital. Gainesville. Florida experience of the ward and in the clinic.

March - June

Rotation, Duval Medical Center, Jacksonville, Florida. Rotation on the wards and in the clinics. Part of the training will include exposure to community medical training.

Prerequisite for admission to this program is at least two years of college or equivalent medical experience such as being a military medical corpsman.

These programs are small and to date only seven have completed the program at the University of Florida. There are currently four trainees in the program at the University of Florida and three at the University of Miami.

Chapter VIII

Education Costs

Costs associated with the development of a School of Optometry may be approximated from the experience of others. Data on a capital outlay are available from two recently planned schools, the University of Alabama at Birmingham and the State University of New York.

At Alabama a $16 million basic sciences building was completed in 1971-72 planned for the instruction of students of several professional schools, including optometry. In addition a building of 70,800 GSF for clinical instruction and service needs is under construction. The estimated cost of construction and movable equipment is $4,733,948. This amounts to $67/GSF. The building is planned for 40 O.D. students per class, plus graduate students, technicians, etc. for a total of 200 students in all.

The State University of New York is planning for construction of 67,025 assignable square feet (approximately 100,000 GSF) for a professional and graduate student body of 267 at capacity.

In line with the recommendation of the National Commission recommendation of a minimum class size of 60 to 75 students, Florida would need a building of at least 100,000 GSF and perhaps larger. Construction costs should be projected at $75/GSF, at least. Movable equipment generally approximates 25% of construction cost. Hence:

Construction	$ 7,500,000
Fees, contingency	900,000
Movable equipment	1,875,000
	$10,275,000

For operating costs the National Commission found a range of 2,726 to $6,300 expenditure per student in 1971-72. The range in students per FTE faculty was 6.4 to 10.9.

The SREB study quoted the per student cost to vary between $5,250 and $8,600 in 1972.

In 1972-73 expenditures per student at the University of Alabama in Birmingham was estimated at $8,800. It must be recalled this school is still in development. The 1974-75 budget request places the per student cost at $8,030.

From the above it seems reasonable to conclude that a School of Optometry in Florida might be expected to cost, in 1974 dollars:

Capital outlay	$10.275 million
Operating expense (annual) 300 X 8,000	$2.4 million

Chapter IX

Student Opportunity

To this point the focus has been entirely upon needs for professionally prepared practitioners in eye care.

The availability of opportunity to enter a rewarding professional career deserves equal emphasis in the thinking of some, especially would-be candidates and their families.

The question must not be dismissed lightly, but it should be recognized the answers are not simple. The recent consequences of "front end loading" of some professions without due regard for output needs of the profession have called attention to the errors of such thinking.

At the same time it must be admitted the science of accurate prediction of market place needs several years ahead is inexact at best. The health care industry may well absorb relatively large proportions of the trained manpower pool in the next decade or two, especially if its services are greatly expanded through broad health insurance coverage. In addition, opinions vary on whether it might be good or bad to over supply the health manpower market.

The principle deterring factor to all-out expansion of opportunity and production in health education is cost. Unfortunately professional programs at the doctoral level requires appreciably more funding than for general education and therefore must compete for resources.

Finally, it must be realized that all of the professional fields are now over-subscribed with capable candidates. Many of those who cannot be accepted today present better credentials for admission than those who were accepted only a few years ago. The availability of high quality candidates for the limited places in any professional school is not in question today; the question is how should their numbers be adjusted to meet the needs of the professions tomorrow.

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FLORIDA OPTOMETRIC ASSOCIATION'S SUMMARY & CONCLUSIONS

EYE CARE MANPOWER NEEDS FOR FLORIDA

OPTOMETRY STUDY

TO: Board of Regents, State of Florida

In November of 1973 the U. S. Department of Health, Education, and Welfare made a study of Optometry in Florida. Future manpower needs for Optometrists in Florida will be strongly influenced by the following:

1. H.E.W. stated that out of the 658 licensed Optometrists, 52 percent were between 40 and 59 years of age, and 7 percent were 60 years or older. This means that the attrition rate of the present practioners through death and retirement over the next 15 years will greatly reduce the proper visual care for the citizens of Florida.
2. Prepaid health care programs and the creation of a national Health Care Service will also tend to bring a burden on Florida Optometry.
3. The Florida Chamber of Commerce states over 6,000 new residents a week are moving into our state. A large number of these people are of semi-retired and retired age. It has been shown that 95% of anyone over the age of 60 requires eye care. Many of these individuals can easily be taken care of by Optometry.
4. "The manpower and education needs for eyecare in Florida," states that the solo Optometrist sees on the average day between 12 and 17 patients. This is on par with the average solo Dentist in Florida.

While the enclosed study was informative and accurate as far as reference material is concerned, in our opinion, the study of July 15, 1969, by the State University System entitled "Optometry Education in Florida", is far more revealing than the present one. The Board of Regents would do well to study its contents before

recommending a course of action.

Since the study sought to cover the broad subject of eye care needs, it included certain basic statistics concerning the practice of Ophthalmology. Additional research is needed to determine whether or not ophthalmologists talents are being fully utilized for the specialty in which they are trained. In a great many of their offices much time and space are devoted purely to optometric procedures and the dispensing of glasses. For this reason, we question a third Department of Ophthalmology in Florida at such a great cost of educating a relatively few practitioners. We also question the wisdom of training Ophthalmic Technicians to perform many procedures which are optometric in nature, for which state statutes provide qualifying examinations for graduates of colleges of optometry.

In recent years Optometrists have contributed greatly to the research and development of contact lenses, electronic screening devices for glaucoma, and the perceptual problems of poor readers among school children.

Florida Optometry Statutes require that up to 25 hours of continuing education be obtained before the issuance of annual license renewal. Improvement of knowledge should be pursued most vigorously by all who care for the health needs of the public. Research and education are most effectively performed in a university setting.

The Florida Optometric Association recommends and directs the Board of Regents to establish a School of Optometry in Florida to provide for the present and future needs of the public. Such an institution would provide a center for (1) teaching and training future optometrists, (2) continuing education for practicing Florida

optometrists, such as is now available to medical physicians through the medical schools of the state, and (3) research in vision for the alleviation of vision disorders of the population.

That this optometry school should be located in a university where those educational facilities are available in the general scientific curriculum, since optometric education is based upon a broad background of training in the fundamental sciences of gross anatomy, microscopic anatomy, embryology, biochemistry, physiology, microbiology, physical and geometrical optics, and psychology. Ideally, the location should be in a setting where research can be coordinated with other health care professions, and where a broad spectrum of the population can be served by the clinical facilities needed for teaching a training purposes.

Respectfully submitted by:

Florida Optometric Association,
Committee on New Academic Facilities

CONCLUSIONS AND RECOMMENDATIONS
OF THE FLORIDA SOCIETY OF OPHTHALMOLOGY

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This paper was requested by Dr. Kenneth Penrod as a comment on the report "Manpower and Education Needs for Eye Care in Florida". It represents a consensus of Ophthalmologists' thinking regarding this Board of Regents study and Optometry in Florida.

The report gives data on current optometric activities in Florida. It digests data supplied by Optometrists in Florida plus national and federal Optometric literature.

The data contained in the report shows that Florida exceeds the national and southern numbers of Optometrists for population at present. It shows that adequate provision has recently been made for optometric education of Florida citizens by contracts for twenty spaces with two southern optometric schools. It shows that adequate numbers of Optometrists are being provided through the state examination system. (Seventy-three passed for licensure in 1973) It shows that this adequate increase in Optometrists to supply projected needs is occurring without reciprocity with other states and with a 30% failure rate on examinations for licensure. This allows two mechanisms for increasing the number should the need arise.

From the data in this report, there is no justification for plunging Florida into a 10 million dollar School of Optometry costing 2.4 million dollars a year to operate.

We believe there are essential questions on eye care delivery which have not been considered by this report, perhaps because of lack of time and funds. Regarding actual health care delivery in Florida patient preferences should be solicited regarding their desire for eye care. It may be that the sophistication of the people of the state causes large numbers to seek medical eye care for all ocular needs. If so, this should be considered in all training programs for future needs.

In addition to consideration of current modes of practice, a thorough query should be made into future care. What effect will the advent of automated refracting equiptment, which is already on the American market, have on the practice of Optometrists and Ophthalmologists? What effect will the increased use of assistants and the increased national health programs have? Will there be a drive to increase the tradional scope of optometric practice to include aspects now regarded as the practice of medicine? A review of the optometric practice act (463.01 Florida Statutes) shows that there are not adequate legal restrictions to prevent such expansion of optometric practice.

We feel these areas should be studied intensively before considering a School of Optometry which would fix as a rigid structure the current concepts of optometric training and which would remove needed dollars from the health care field, when valid studies show that primary care needs are most pressing, not visual care needs.

We propose that this present report be considered as an interim study and that the Legislature establish and fund a continuing study made up of Board of Regents staff and the Health Planning Council, plus official representatives of Ophthalmology and of Optometry to examine these questions in addition to possible new modes of training Optometrists and their assistants to provide economical, high quality visual care in accordance with the needs and wishes of the people of Florida.

January 15, 1974

Summary and Conclusions

of the Florida Health Planning Council
Health Manpower Committee, FHPC

A SCHOOL OF OPTOMETRY

Semantic difficulties stem from the differences between the professions of optometry and ophthalmology. Optometrists contend that their area of concern centers on vision care. Ophthalmologists claim to provide eye care and generally refuse to separate vision from other components of eye care. Optometrists often contend that they are the primary care specialists, the ones through whom the majority of people enter the health care field for all eye care. Ophthalmologists refuse to accept only a secondary or tertiary care role.

The extent and nature of presently unmet eye care needs has not been clearly defined. Correction of many of the problems associated with vision is elective and so long as these must be paid for by the individual it is unlikely that all who need care will seek it. It is well known that there are many cases of undiagnosed and untreated conditions which are medical in nature, such as glaucoma. Until this pool of unmet need is more clearly identified, and described, it is not possible to say what effect this has on needs for professionally trained manpower as represented by presently known professions.

There appears to be an unfortunate extent of overlap in the nature of services rendered to patients by individuals with greatly different education and training. In the two professions of optometry and ophthalmology, each with its own trained assistants, it is quite unclear where care responsibilities begin and end. Such an arrangement carries with it the twin dangers of inadequate preparation for some duties and inefficient utilization of over-trained providers for other duties. There seems to be little hope for clarifying this picture in the present climate of minimal communication in this state.

There is a growing concern within Florida for learning disabilities among school children. Evidence appears to support the view that vision defects may account for some proportion of this problem. The need for screening and follow-up care for this large segment of society must be provided for by means as yet not clearly defined.

A question of the durability of the SREB contracts for places in optometric schools for Florida residents was raised. It was pointed out that Southern College in Memphis has faced a serious financial crisis and should this school be forced to close, or be taken over by the State of Tennessee, the contracted places for Florida students might disappear. There is no way of knowing at this time whether or not this is any threat.

There was general consensus that larger numbers of professional providers of vision and eye care in Florida will be needed by 1980. This will result from an anticipated large increase in population, a greater attention to that segment of society that is not now receiving adequate care, and a new societal concern for reading difficulties among school children.

On the basis of the data available to this committee the following recommendation is forwarded:

Recommendation

There are too many unanswered questions to allow a final decision on the need for a new school of optometry at this time. The impact of new movements in public education of school children, the nature and extent of the unmet eye care needs in the state and how best to provide for those needs, the potential impact of newer forms of automation of diagnostic techniques, the effect of an expanding assistant program for both optometrists and ophthalmologists - all need further study. A better clarification of duties and responsibilities and their relation to educational preparation is needed in order to propose the best course of action for Florida. This report, therefore, should be accepted as an interim report and a request should be made for support to carry out an extension of these studies, in accordance with the above broadly outlined informational needs. A final report should be prepared for the 1975 Session of the Florida Legislature.

Conclusions and Recommendations

of the Florida Medical Association
Committee on Medical Schools

With regard to the need for a school of optometry, it is the conclusion of the Florida Medical Association Committee on Medical Schools that there is no demonstrated need for a separate school of optometry at the present time. It is the Committee's opinion that if the need for training such individuals in Florida can be justified in the future, such training could be carried out more economically by utilizing the existing educational programs in ophthalmology.

January 1974

Conclusions and Recommendations
of the Health Affairs Committee
to the Board of Regents
State University System of Florida

The Florida Optometric Association recommends the immediate establishment of a school of optometry. The favorable recommendation of optometry is based upon the feeling that a large segment of the current practitioners will retire within the next 15 years and need to be replaced, a prepaid health care plan is imminent and will place a burden on optometry, and that Florida's growth rate and proportion of older population places unusual demands on the profession. It is their desire that the school would provide a center for: (1) Teaching and training future optometrists, (2) Continuing education for practitioners, and (3) Research in vision.

The Florida Health Planning Council, the Florida Medical Association Committee on Medical Education and the Florida Society of Ophthalmologists, all recommend against the authorization of a school of optometry in Florida by the 1974 Legislature. The three groups agree that more studies are needed of ways to deliver eye care efficiently. It should be made clear none have assumed a position of opposition to the training of optometrists. The points in question are the urgency for immediate action to initiate a school, and the need for examination of the tasks making up the totality of eye care.

The studies mentioned above as needed would possibly serve to answer some points raised by the Health Manpower Committee of the FHPC in their recommendations. These points are:

1. The impact of new movements in public education of school children.

2. The nature and extent of the unmet eye care needs in the state and how best to provide for those needs.

3. The potential impact of newer forms of automation of diagnostic techniques.

4. The effect of an expanding assistant program for both optometrists and ophthalmologists.

This committee recommends to the Board of Regents that we defer the request of the Florida Optometric Association to establish a school of optometry in Florida for another year. However, the BOR should support the extension of the studies of eye care and its manpower needs through another year in order to provide recommendations to the 1975 Legislature.